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VI. Observations of the Transit of Mercury over the Sun, Oct. 31. 1736. communicated to the Royal Society.

1. An Observation of the Transit of Mercury over the Sun, Oct. 31. 1736. by Mr. George Graham, F. R. S. made in Fleetstreet, London.

Oct. 31. A. M.

Apparent Time.

H. M. S.

At	9	22	00	<i>Mercury</i> not yet seen, then Clouds.
	9	25	37	I first saw <i>Mercury</i> for a few Seconds, and judged he was got intirely within the <i>Sun's</i> Disk, or perhaps a little more, then Clouds again, with some Intervals of a few Moments between, which allow'd us a Sight of <i>Mercury</i> about three or four several times; then quite cloudy till near 12, when we had a Sight of the <i>Sun</i> for a few Minutes, and took his <i>Transit</i> upon the Meridian; at which time we judged <i>Mercury</i> to be about two of his Diameters, or a little more, within the <i>Sun's</i> Disk, and a little past the vertical Line.
	12	10	27	We had again a Sight of the <i>Sun</i> , but <i>Mercury</i> was gone off.

2. Con-

2. *Congressus Mercurii cum Sole in Astronomica Specula Bononiensis scientiarum Instituti observatus, die xi Novembris, MDCCXXXVI. (N. S.) mane: referente Eustachio Manfredio, ejusdem instituti Astronomo. & R. S. Lond. S.*

CUM mihi ob adversam valetudinem transitum hunc Mercurii sub Sole nonnisi per intervalla spectare, neque in eo mihi ipsi satisfacere licuerit, referam paucis, quæ in hac specula non tam a me quam a Viris doctissimis, qui frequentes huc adventare consueverunt, observata fuerint, præsertim vero ab egregio juvene *Eustachio Zanotto Phil. Doc.*, qui meas in astronomica professione vices gerit; deinde ea subjungam, quæ postmodum ex observationibus in typum relatis, atque ad calculos expensis una cum illo defini.

In supremo speculæ conclavi, unde majores tubi optici promi, aptarique possunt, intenderat *Zanottus* in Solem optimæ notæ telescopium, a Campano elaboratum, pedes 22 Bononienses longum, quo ipsum, si fieri posset, Mercurii in marginem Solis incursum notaret; ac quando incursum illum quorundam astronomorum calculi maturius, aliorum serius, complurium scrupulorum dissidio, pollicebantur, cum *Josepho Roverfio* condixerat, si quando ipse cessasset, ut is confestim eidem telescopio succederet. Alii interea aliunde brevioribus tubis in idem intendebamus. Cœlum erat nitidissimum, aer nullo ventorum flatu perturbatus. Obtigit *Roverfio*, ut omnium primus Planetam ad Solis marginem deprehenderet hora post meridiem 22. 8. 37. ac mox interiorem ejus cum Sole contactum definiret hora 22. 11. 12. Horologiis utebamur

mur ad meridianam lineam per eosdem dies expensis, quam ipsam lineam *Zanottus* per æquales altitudines matutinas ac vespertinas pluries ad Solem exegit.

Observatoribus aliis paullo serius Planeta in Solis limbo est animadversus. Mihi, ex inferiori conclavi collimanti telescopia Campani pedum 11 non ante horam 22. 9. 5. est conspectus, cum jam sat notabili sui parte Solem delibaret, contactus autem interior eodem tubo æstimatus hor. 22. 10. 53. Sed longe certior prior illa observatio, quippe quæ præstantiori instrumento est habita. Quoniam tamen ex temporibus egressus Planetæ mox afferendis constitit ejus corpusculum in excessu impendisse min. 3. 16. si tantumdem ex tempore contactus interioris a *Roversio* notati subduxerimus, fiet contactus exterior, sive primus Mercurii ad Solem appulsus adhuc certior hor. 22. 7. 56.

Deinceps observationes eo spectarunt, ut puncta aliquot invenirentur ejus semitæ quam Planeta in Sole describere visebatur. Ea puncta singula ad circulum horarium, necnon ad parallelum per centrum Solis ductum retulimus, Cassiniana methodo, notatis ex horologio temporibus, quibus & limbi Solis, & Mercurii filum horarium micrometri, hic vero præterea etiam obliqua pertransiret, interea dum Sol boreo sui margine filum ipsum parallelum perraderet. Multa ejuscemodi puncta nactus est *Zanottus* telescopia pedum 8; unum ego vel alterum tubo pedum 6, cui tubo micrometrum aptatum erat exquisiti operis a viro cl. *Jo. Jacobo Marinonio Mathematico Cesareo* exco-
gitatum, atque huic observatorio dono missum. Eodem & *Roversius*, & *Thomas Perellus*, M. D. nonnulla puncta alia determinarunt. Huc etiam pertine observatio a *Perello* in ipso meridiano habita, murali
semi-

femicirculo, qua observatione inventa est Planetæ ascensio recta secundis $11 \frac{1}{2}$ temporariis major, declinatio autem secundis $58 \frac{1}{2}$ temporariis minor quam centri Solis. Illud præterea *Zanottus* sibi sumpsit, ut insigniorum macularum, quæ plures eo die in Sole cernebantur, positus describeret. Ab iis maculis facile erat Planetam internoscere, & quod exacte rotundus, & quod nigerrimus, & quod nulla areola esset obseptus.

Ad Mercurii egressum quod attinet, *Franciscus Algarottus*, *R. S. Lond. S.* qui nuper ex Gallia & Britannia in Italiam redux hujusce phænomeni spectandi gratia Bononiam se contulerat, tubo pedum 8 usus initium notavit hora a meridie o. 50. 1, finem hor. o. 53. 6; ego vero telescopio illo 11 pedum initium hor. o. 51. 7, finem hor. o. 53. 44; *Roversius* telescopio pedum 14 finem tantum advertit hor. o. 54. 1; verum hæ observationes minus certæ cum ob mediocrem tuborum præstantiam, tum quod ventus id temporis coortus tubos ipsos nonnihil agitare. Præferenda ergo hisce omnibus observatio telescopio illo pedum 22 habita, quo *Franciscus Vandelius*, in hoc scientiarum Instituto *militaris architectura professor*, interiorem contactum definivit hor. o. 50. 50, exteriorem hor. o. 54. 6, unde mora planetæ in limbo min. 3, 16, & tempus egressus centri hor. o. 52. 28, quod ex mea observatione foret hor. o. 52. 25.

Hactenus observationes ipsæ; nunc quæ ex earum inter sese collatione una cum *Zanotto* deduxerim, persequar. Assumpta Solis diametro min. 32. 34, ac tempore ejus transitus per circulos horarios min. 2. 17. (quos numeros & recentiorum astronomorum tabulæ exhibent, & observationes ipsæ comprobarunt) puncta

illa planetariæ semitæ observando definita in typum retulimus; ac cum ob exiguas observationum fallacias minime omnia examussim in eandem rectam lineam incidrent, nullam eorum conciliandorum rationem aptiorem invenimus, quam si statueremus perpendicularē lineam ex centro Solis ad planetæ semitam ductam angulum cum horario circulo comprehendere grad. 23. 40 ad ortum: ejus vero perpendicularis longitudinem a centro ad ipsam semitam poneremus min. 13. 58 ad boream. Ex his reliqua omnia calculo deduximus in hunc modum.

Initium ingressus Mercurii in So-	Hor.	'	"
lis discum	hor. 22	7	56
Ingressus centri	hor. 22	9	34
Totalis ingressus	hor. 22	11	12
<hr/>			
Initium egressus	hor.	0	50
Egressus centri	hor.	0	52
Totalis egressus	hor.	0	54
<hr/>			
Mora centri Mercurii in disco			
Solis	hor. 2	42	54
Semimora	hor. 1	21	27
Tempus medii transitus	hor. 23	31	1
<hr/>			
Angulus linæ perpendicularis ad			
semitam planetæ cum circulo		°	'
horario ab observationibus defi-			"
nitus, ad ortum	gr. 23	40	0
Angulus eclipticæ cum horario ex			
tabulis astronomicis ad ortum	gr. 105	48	0

Inde angulus eclipticæ cum perpendiculari ad Mercurii semitam apparentem

gr. 82 8 11

Et angulus semitæ app. cum ecliptica

gr. 7 52

Distantia semitæ a centro Solis ab observationibus inventa ad hor.

gr. 0 13 58

Semidiameter Solis

gr. 0 16 17

Longitudo semitæ intra Solis difcum

gr. 0 16 45

Ejus longitudinis dimidium

gr. 0 8 22

Ex his motus horarius Mercurii in semita apparenti

gr. 0 6 10

Motus horarius apparens in ecliptica

gr. 0 6 6

Inde portio semitæ inter medium transitus & conjunctionem

gr. 0 1 58

Portio semitæ ab ingressu ad conjunctionem

gr. 0 10 20

Portio ejusdem a conjunctione ad egressum

gr. 0 6 24

Differentia longitudinis Mercurii & Solis in ingressu

gr. 0 10 15

Differentia longitudinis in egressu

gr. 0 6 21

Tempus a medio transitus ad conjunctionem

hor. 0 19 2

Tempus ipsum conjunctionis Bononiæ

comp. ver. hor. 23 50 3

temp. med. hor. 23 34 25

O 2

Lon-

Longitudo Solis & Mercurii in ipsa conjunctione e Cassinianis tabulis

	2	1	11
<i>Scorpii</i> gr.	19	23	30

Huic longitudini respondet intra sec. 4. observatio a *Petro Lilio* J. U. D. eodem die habita gnomone meridiano ad Divi Petronii.

Latitudo Mercurii in ingressu bor.	gr.	0	12	37
Latitudo in egressu bor.	gr.	0	14	54
Inde motus horarius in latitudinem	gr.	0	0	50 $\frac{x}{2}$
Et latitudo in ipsa conjunctione bor.	gr.	0	14	1

Ex his intervallum temporis a transitu Mercurii per nodum ascendentem ad conjunctionem

hor. 16 39

Et tempus ipsum transitus per nodum

t. ver.	hor.	7	11
t. med.	hor.	6	55

Ex tabulis Cassinianis motus Mercurii in orbita e Sole visus intervallo horarum 16, 39 circa hoc tempus, seu argumentum latitudinis in conjunctione

gr.	4	15	47
gr.	4	13	56

Idem motus ad eclipticam reductus

Inde locus nodi ascendentis Mercurii e Sole visus

<i>Tauri</i> gr.	15	9	34
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Distantia

Distantia Mercurii a Sole ad tempus conjunctionis e tabulis Casfinianis

Log. 449301

Distantia Telluris a Sole ex iisdem tabulis

Log. 499503

Inde latitudo Mercurii in conjunctione, e Sole visa bor.

gr. 0 30 31

Unde inclinatio orbitæ Mercurii ad eclipticam

gr. 6 51 0

Tempus a contactu interiori Mercurii ad exteriorem in egressu ex observatione

bor. 0 3 16

Portio semitæ hoc tempore a Mercurio peragrata

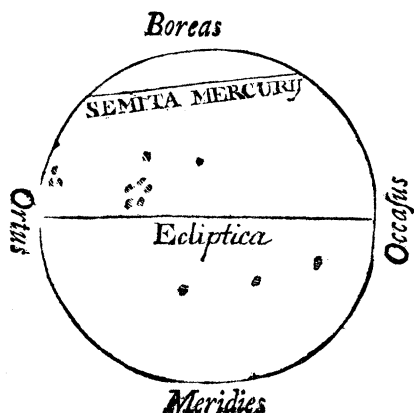
gr. 0 0 20

Angulus semitæ ipsius cum semidiametro Solis in egressu

gr. 58 50 0

Inde diameter apparens Mercurii quamproxime

gr. 0 0 10



3. *Extracts of a Letter from Mr. Professor Weidler, F. R. S. &c. to Dr. Mortimer, Secr. R. S. dated at Wittemberg, Jan. 1, 1737. N.S. Translated from the Latin by T. S. M.D. F. R. S.*

I Have lately answer'd your agreeable Letter of Oct. 26. 1736. and now send you a printed Copy of my Observation of the *Transit* of *Mercury* over the *Sun*, on *Nov. 11.* for though the uncertain State of the Weather was some Hindrance to a complete Observation, yet what I observ'd, I thought proper not to deprive others of; chiefly because it does not appear to me, that this *Phenomenon* has hitherto been seen with better Success.

I beg you will send the other Copy to Dr. *Halley*.

Dr. Weidler's Observations of Mercury's Transit; extracted from the printed Account.

Mercury appear'd within the *Sun's* eastern Limb (as in the Scheme)

H. M. S.				
10	49	20	at	1
11	36	00	- ½ abt.	2
11	52	20	- at	3
12	2	30	-	4
	4	30	-	5
	44	20	-	6
	52	45	-	7

